

Denitrifying Bioreactor – Hauraki Plains – Waikato – New Zealand



Membrane type: Firestone GeoGard EPDM 1.1 mm

Membrane Surface: 168 m² (installed in 2 hours)

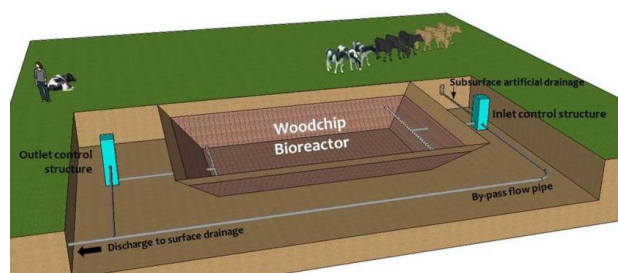
Installation date: March 2017

Depth: 1.7 m

Total excavated volume: 127 m³

Effective Treatment Volume: 60 m³

Geotextile: 155 g/m²



Even if we might not know the meaning of ‘eutrophication’, we have all seen green rivers or lakes, caused by a dense algal bloom. This phenomenon arises from the excess of nutrients released into fresh waters from domestic effluent, or industrial and agricultural activities. It is a worldwide environmental concern that reduces aquatic biodiversity and water quality.

Artificial drainage accelerates the pathway, due to short-circuiting, into rivers of nitrates coming from the urine of grazing animals or manure application. Lincoln Agritech and Aqualinc Research have established a pilot-scale denitrifying bioreactor draining an area of 0.65 ha dairy cow grazed paddock. The objective is to determine the optimal design of this practical and cost-effective solution to reduce by 50% the nitrate load discharging from tile drains under New Zealand conditions. The denitrifying bioreactor converts nitrate in the drainage water to harmless nitrogen gas via microbial activity, using only non-treated woodchips as a low-cost and easily available energy source.

Early monitoring results show nitrate levels from 3 to 8.5 mg N/l in the drainage water have been reduced to less than 0.02 mg N/l after passing through the wood chip bioreactor.



Photos and figures courtesy of Lincoln Agritech, Aqualinc Research and Cosio Industries

Quick Reference



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